

# Incidence of Joint Infection in Calves

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## Summary

Clinical examination of 34 naturally affected calves with septic arthritis were done in the Baghdad area. Bacteriological examination of the synovial fluid taken from the affected joints showed that 21 cases were positive (61.8%) and 13 were idiopathic (38.2%).

The incidence was higher in males (64.7%) than in females (35.2%) in the first month of age and infection of the carpal joints were more common than those of the hock joints. The highest incidence (11.8%) of positively affected joints were due to mixed infection caused by *Klebsiella ozaenae* & *Proteus mirabilis*.

## Introduction

Infectious arthritis is one of the most prevalent diseases of the locomotor system in calves which cause high economic losses. It is an inflammation of the synovial membrane and articular surfaces as a result of infection, characterized by lameness and local pain, heat and swelling of the joint.<sup>1</sup>

Haematogenous infectious polyarthritis is common in new born calves as a result of infection of the umbilicus at birth. This syndrome has been termed "joint ill", "neonatal-polyarthritis", "pyosepticemia of the new born", or as a result of intra-uterine infection, gastrointestinal infection, osteomyelitis etc. . . , while calves with hypogammaglobulinemia are considered as highly susceptible to bacteremia and meningitis, ophthalmitis and arthritis.<sup>1,2,3</sup>

The most prevalent microorganisms responsible for causing infectious arthritis in calves were found to be *Corynebacterium pyogenes*, *Staphylococcus aureus*, *Escherichia coli*, *Streptococcus spp.*, *Salmonella spp.*<sup>4,2</sup> while others referred to *Mycoplasma spp.*, *Erysipelothrix insidiosus*, *Chlamydia Psittacci*.<sup>5,1</sup>

**The purpose of this study was to ascertain the incidence and causative agents of infectious arthritis in calves.**

## Materials and Methods

A total of 34 calves (newly born up to 20 weeks), with septic arthritis were examined clinically around

Baghdad city, during the period March 1987 and February 1988.

The diagnoses were assessed by examination of synovial fluid for the presence of microorganisms. Synovial effusion samples were aspirated by arthrocentesis from affected carpal and hock joints. Disposable syringes were used for aspiration, (Ross and Frauenfelder).<sup>6</sup>

Isolation and identification of microorganisms in synovial fluids were done by standard procedures (Cowan & Steel).<sup>7</sup>

## Results

### 1. Clinical Observation:

The clinical signs which usually accompanied or preceded cases of arthritis in calves are listed in Table 1. Palpation revealed different degrees of hypersensitivity and inflammation of the affected joints. Systemic infections were so severe in some calves that they were in lateral recumbency. They were reluctant to move and when forced to do so; claudication was evident.

### 2. Results of Age, Sex, Joint Predisposition:

presented in Table 1 and Figs. 1, 2.

### 3. Bacteriological Findings:

Synovial effusion samples from 21 positive cases of calves yielded different types and percentage of microorganisms (Table 1).

Cultures for *Mycoplasma spp.* were negative in all cases examined.

## Discussion

Septic polyarthritis in calves occurred most commonly during the first few months of age, which might be due to low quantity of colostrum received or hypogammaglobulinemia due to bad nutrition during pregnancy. These findings were in agreement with Platt<sup>8</sup> in foals.

The highest incidence (64.7%) was observed in males against (35.3%) in females. This could be due to farmers usually paying more attention to females which is in agreement with several researchers.<sup>9,10,11</sup>

**Table 1.** Incidence of microorganisms isolated from the joints of calves according to age, sex, and joints affected, with the clinical signs accompanying or preceding cases of arthritis.

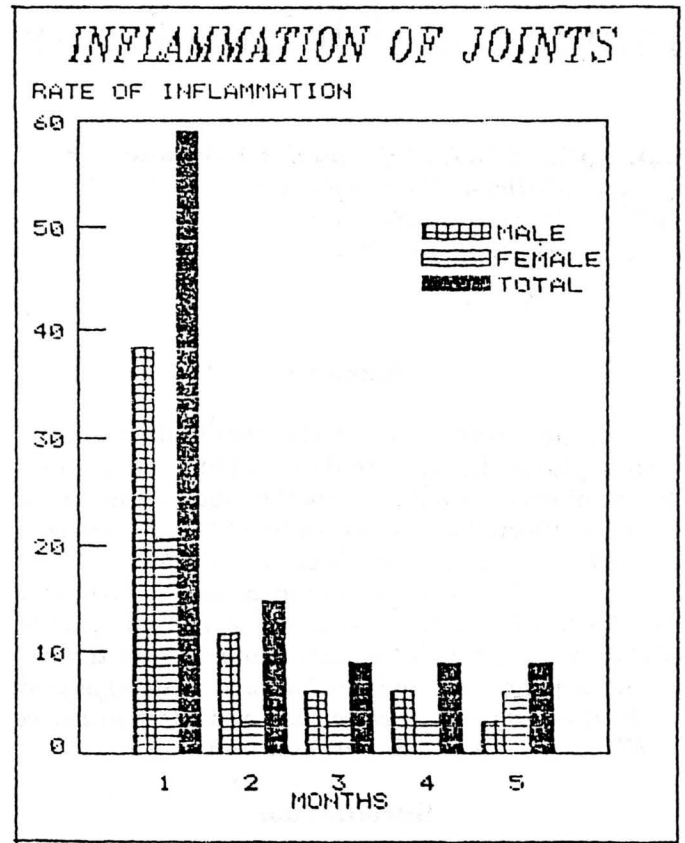
Case No.	Microorganisms	Age/Week	Sex		Carpal					Joint affected					Hock	Clinical Signs	
			M	F	R.I.C.	L.I.C.	R.C.	L.C.	R.H.	L.H.	R.T.T.	L.T.T.	DURATION (days)				
1	<i>E. Coli</i>	2.9	2	+		+										30	swelling of joints, swelling and congestion of the umbilicus directly after birth
2	<i>E. Coli</i> & <i>Kl. Ozaenae</i>	2.9	3	+			+									15	Diarrhea started one week after birth, swelling of joints
3	<i>Kl. Ozaenae</i>	2.9	3	+		+										7	salivation, lacrimation, coughing, then joints swelling
4	<i>Kl. Ozaenae</i> & <i>Pr. Mirabilis</i>	11.8	7		+	+										30	swelling of joints with recumbency, dehydration, sinking eye, fever
5	"	2	+						+	+						3	Diarrhea, fever, swelling of joints
6	"	6	+			+				+						15	Diarrhea, swelling of joints
7	"	12		+	+	+										15	swelling of joints, whitish diarrhea one week after birth
8	<i>Pr. Mirabilis</i>	2.9	4	+		+										28	swelling of joints just after birth
9	<i>C. Pyogenes</i>	2.9	2	+		+										15	swelling of joints then fever, diarrhea
10	<i>C. Pyogenes</i> & <i>C. Bovis</i>	2.9	16	+		+	+									15	coughing nasal discharge then joints swelling
11	<i>C. Pyogenes</i> & <i>Str. Pyogenes</i>	2.9	4	+									+			21	swelling of joints only
12	<i>Str. Pyogenes</i>	2.9	20		+	+										10	" " " "
13	<i>Str. Pyogenes</i> & <i>C. Bovis</i>	2.9	12	+		+										21	Diarrhea just after birth then joints swelling
14	<i>Streptococcus Spp.</i>	5.9	20	+		+	+							+		21	coughing, diarrhea, then joints swelling
15	"	6	+			+										30	swelling joints only
16	<i>Staphylococcus aureus</i>	5.9	1		+	+	+		+							6	Diarrhea then swelling joints
17	"	3	+										+	+		10	swelling of joints only
18	<i>Micrococcus Spp.</i>	5.9	16	+						+	+					18	coughing, salivation, then swelling of joints
19	"	1		+		+				+	+					10	swelling of joints, bloody diarrhea just after birth
20	<i>Enterobacter Spp.</i>	2.9	1		+					+						3	yellowish watery diarrhea joint swelling just after birth then death
21	<i>Moraxella Spp.</i>	2.9	3	+							+					15	swelling of joints only
22-24	Negative results	38.2	1-32	8	5	7	10				1	2	2	2	3-20		swelling of joints and diarrhea

NOTE:-  
 L. I. C. = Left Inter Carpal      R. I. C. = Right Inter Carpal  
 L. R. C. = Left Radio Carpal      R. R. C. = Right Radio Carpal  
 L. C. M. = Left Carpo-Meta Carpal      R. C. M. = Right Carpo-Meta Carpal  
 L. T. T. = Left Tibio Tarsal      R. T. T. = Right Tibio Tarsal

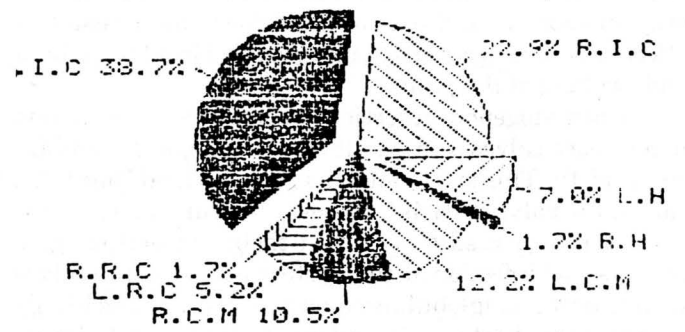
Vanpelt and Langham<sup>12</sup> stated that hock joints are more susceptible to hematogenous infection owing to its highly vascular synovial membrane, while the present work showed that the highest incidence was in the carpal joint as compared with the hock joint. This could be due to repeated trauma during movement and agrees with VijayKumar *et al.*

VijayKumar *et al.*<sup>11</sup> claimed that the incidence of right carpal infection in cattle and buffalo was higher than in the left, while our study in calves recorded opposite results. Similar observations regarding the high incidence of left hock joint (7%) as compared with the right one (1.7%) were reported by Vanpelt and Langham<sup>12</sup> which contradict Nigam *et al.*<sup>10</sup>

The most important clinical signs observed in arthritis were swelling of joints, lameness that might be due to pain or joint lesion.<sup>12,24</sup> In addition, fever was considered especially during the first week of infection which led to severe, acute inflammation causing increased absorption of bacteria, and decreased when the



**Figure 1.** Percentage of Infectious Arthritis in Calves According to Age and Sex.



**Figure 2.** Percentage of Carpal and Hock Joints Infection.

inflammation become chronic,<sup>25</sup> it was observed in case of infection due to *Pr. mirabilis*, *Kl. ozaenae*, *C. pyogenes*; this was in agreement with Cowie.<sup>26</sup>

In this study, arthritis in calves occurred after enteritis and diarrhea or omphalophlebitis, or respiratory diseases which was in agreement with Vanpelt.<sup>13,23</sup>

*Pr. mirabilis*, *C. pyogenes*, *Str. spp.*, *Staph. aureus* and *Micrococcus* were isolated from joints of calves and adult cattle with septic arthritis.<sup>4,12,13</sup>

These observations were in agreement with our findings.

However *Kl. ozaenae*, *Enterobacter spp.*, *C. bovis*,

*Moraxella spp.* were isolated for the first time in calves but were recorded by other workers in man, dog and foals.<sup>14,15,16,17,18,19</sup> The highest incidence was with mixed infection due to *Kl. ozaenae* and *Pr. mirabilis* (11.8%).

Negative results for bacteria and mycoplasma in some cases might be due to previous treatment with antibiotics prior to the collection of samples.<sup>20,21,22</sup>

On the other hand, Vanpelt and Langham<sup>23</sup> considered that in acute or subacute cases sufficient time may not have elapsed for the infecting microorganisms to multiply in sufficient numbers to permit isolation in bacteriological cultures, or due to idiopathic septic arthritis.

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## Abstract

### Antithrombin-III activity in plasma of healthy and sick cattle

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Antithrombin-III (AT-III) activity was determined in the plasma of 32 healthy cows. The range of activities was between 105 and 160 percent of a human reference plasma; the median activity was 132.5 percent, and the 5 percent and the 95 percent quartiles were 111.1 percent and 153.9 percent of the standard. The activity of AT-III was also determined in 82 cows with a variety of internal diseases. In cows with hepatopathy,

acute enteritis, generalised peritonitis, blood loss, idiopathic cardiomyopathy, glomerulonephritis and disseminated coagulopathy, the activity of AT-III was lower than in healthy animals. The lower values were due to decreased synthesis, increased consumption, or the loss of AT-III. An acquired deficiency of AT-III appears to favour the development of thrombophlebitis.